Some of the unnatural ways we try to make hybrid communication natural

Turings Venner, 26.09.2024

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Let’s talk about video meetings

How many of you have been in a video call meeting?

How many of you have been attending a otherwise physical meeting through a video call?

How many of you have been attending a physical meeting with someone else being on a video call?

Hybrid meetings

Some people are collocated, and one or more people are remote and mediated through technology.

Asking the real questions:

- How do we perceive the remote person?
- How human are they?

Neumayr (2021)

Motivating the question

Where are the remote participants in this image? How are they represented in the space?

In this talk we:

- Introduce hybrid meetings from a academic perspective
- Present a body of work regarding long distance communication (aka. some funky ways people have tried to ‘solve’ hybrid meetings)
- Present our work on hybrid collaboration.

What is “hybrid”?

A hybrid meeting meets the following criteria:

- Two or more physical locations
- One or more people in each location
- Synchronous communication
- One or more digital communication tools

Buxton, B. (2009)
Mantei et al. (1991)
Neumayr et al. (2021)

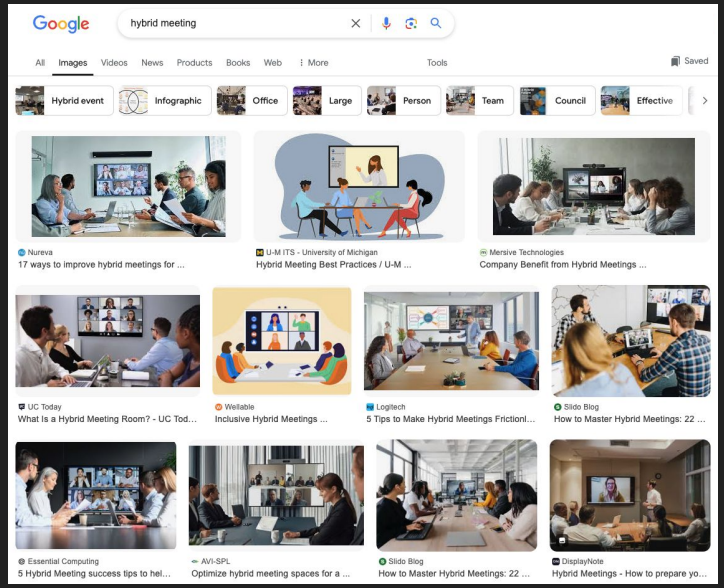
What is “hybrid”?

Long distance communication was previously called *tele-communication*, *tele-commuting* and *media-spaces*. “Hybrid” is a product of COVID19:

“[…] the emergent concepts on what we might want to call hybrid collaboration and meetings do not reflect a common understanding, conceptualisation, and definition of phenomena that the world is now desperately racing to understand.”

Neumayr er al (2021)

In our work we focus on hybrid meetings rather than hybrid collaboration.



Buxton, B. (2009)
Mantei et al. (1991)
Neumayr et al. (2021)

Asymmetries in hybrid communication

Asymmetry in media spaces

Face-to-face contexts

Asymmetry in awareness systems

Awareness of the status of others

Four approaches to tackle asymmetries:

1) Accept them
2) Minimise them
3) Remove them
4) Expand on them

Asymmetry of:

- Media
- Fidelity
- Participation
- Engagement
- Benefit
- Place

Voida et al. (2008)

Examples of addressing the asymmetries

Representation or Abilities in Research

Representation

Abilities

Representation or Abilities in Research

Representation

Abilities

Blended Interaction Spaces

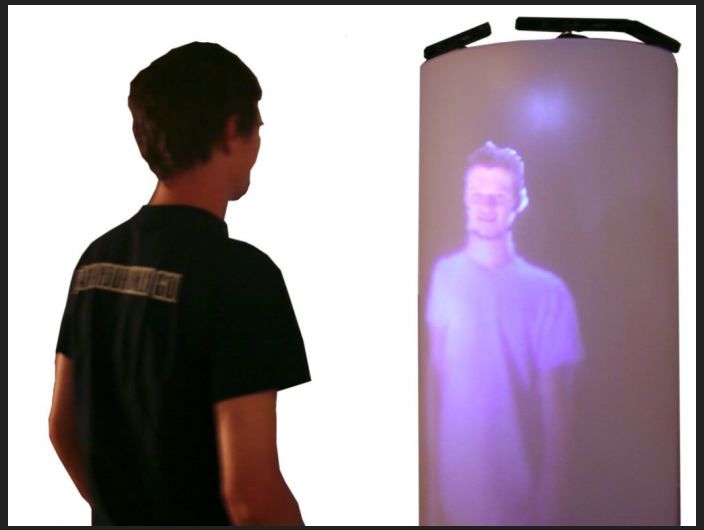
O'hara, K., Kjeldskov, J., & Paay, J. (2011)

Representation or Abilities in Research

Representation

Abilities

Telehuman



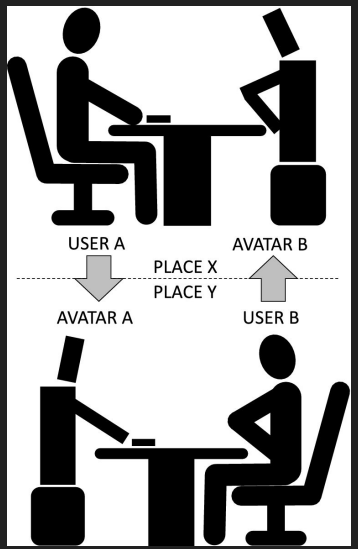
Kim, K. et al. (2012)

Representation or Abilities in Research

Representation

Abilities

Unnamed Avatar Robot



Anastasiou, D., Stahl, C., & Latour, T. (2019)

Representation or Abilities in Research

Representation | Abilities

Vroom

Jones, B. et al. (2020, April)

Representation or Abilities in Research

Representation

Abilities

The Surrogate

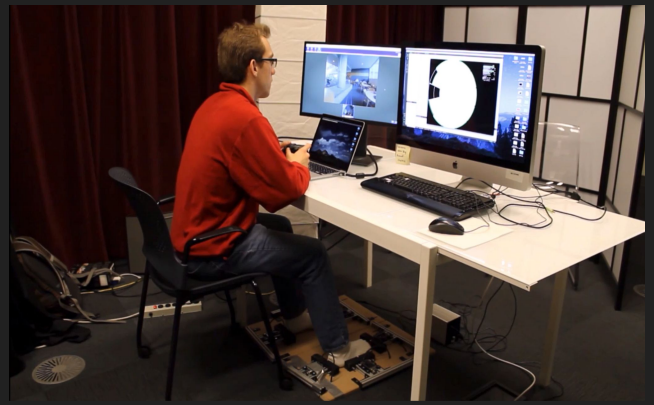
Jouppi, N. P. (2002)

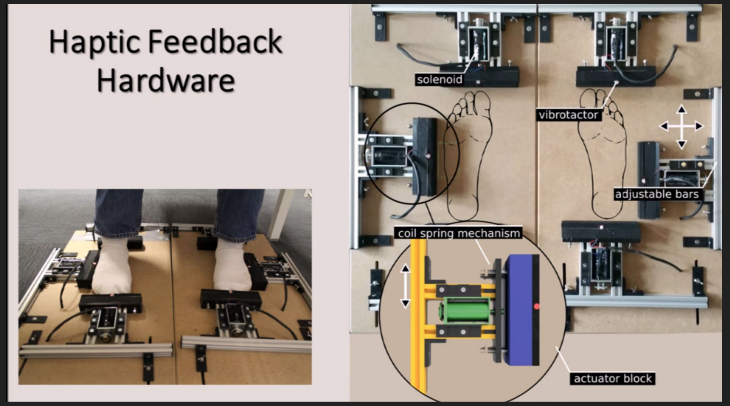
Representation or Abilities in Research

Representation

Abilities

Feetback





Jones, B. et al. (2020, October)

Representation or Abilities in Research

Representation | Abilities

MeBot

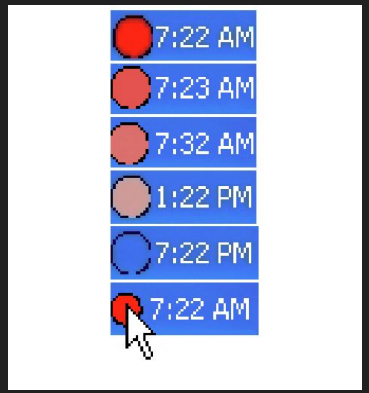
Adalgeirsson, S. O., & Breazeal, C. (2010)

Representation or Abilities in Research

Representation

Abilities

Virtual Intimate Object



Kaye, J. J. (2006)

Moving beyond the human

The focus is no longer on creating a sense of a human presence, but enhancing the remote participants through:

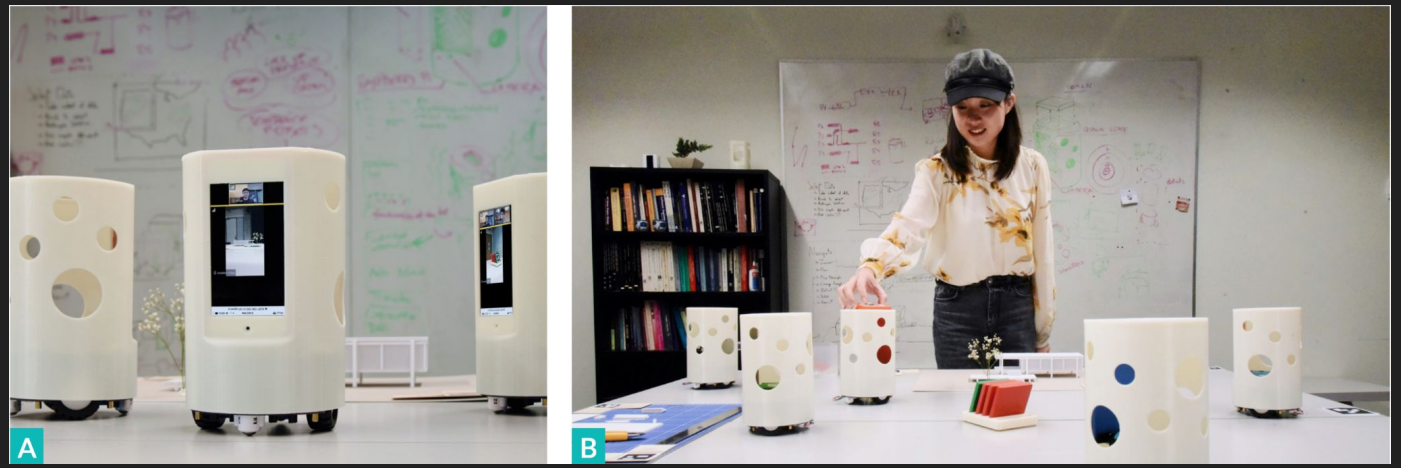
- Shifting the focus towards successful collaboration and task completion.
- Abilities that enhance remote participants beyond what a human can do.

Beyond human abilities in Research

Representation

Abilities

Asteroids



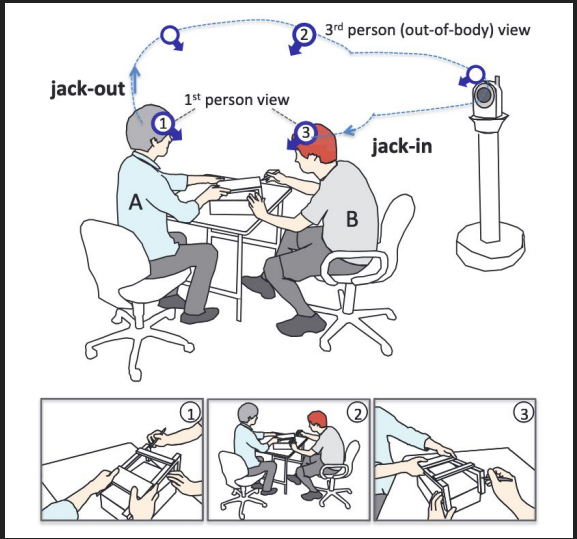
Li, J. et al. (2022)

Beyond human abilities in Research

Representation

Abilities

JackIn Space



Komiyama, R., Miyaki, T., & Rekimoto, J. (2017)

Beyond human abilities in Research

Representation

Abilities

Unnamed AR system

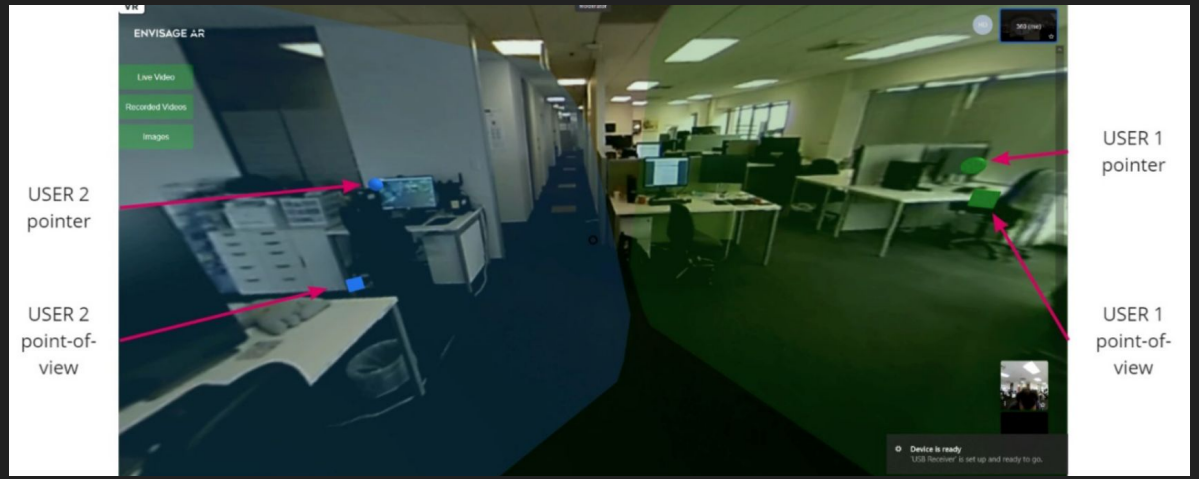
Piumsomboon, T. et al. (2019)

Beyond human abilities in Research

Representation

Abilities

ShowMeAround



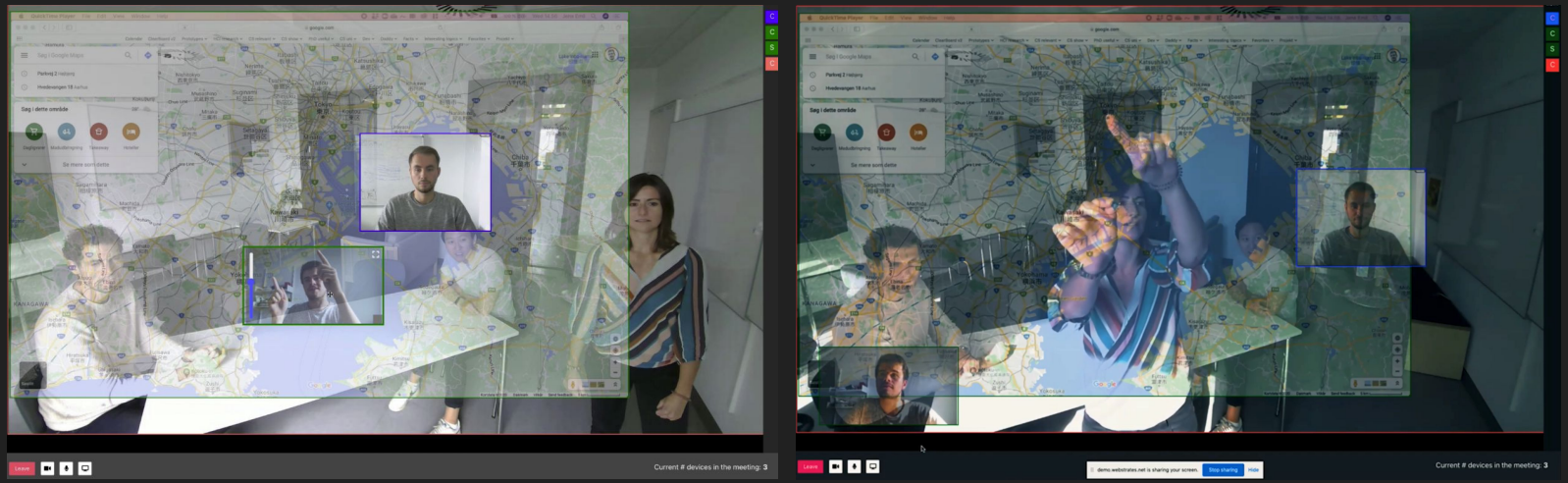
Nassani, A. et al. (2021)

Beyond human abilities in Research

Representation

Abilities

MirrorBlender



Grønbæk, J. E. et al. (2021)

Let’s go with Telepresence Robots

We seek to move beyond the human representation and focus on the abilities of a human - and maybe even abilities beyond what is human.

A telepresence robot has:

- A camera and microphone to capture the environment.
- A screen to show the face/upper body of the user.
- Wheels to move around
- Battery powered (not tethered to the wall)
- Wireless communication

Desai et al. (2011)

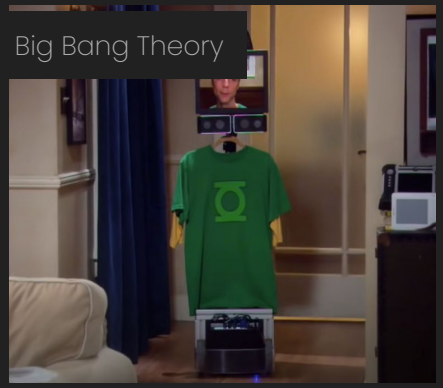
You probably know them from:

Modern Family

Community

South Park

Big Bang Theory



Demolition Man

Bob's Burgers

Degrees of perceived humanity

How do we know how human something or someone is perceived?

Shouten et al. (2022)

Robomorphism: Robot representation is perceived as something beyond a human or a machine. The perception of the human merges with the machine, producing something neither completely human or completely machine

Takayama & Go (2012)

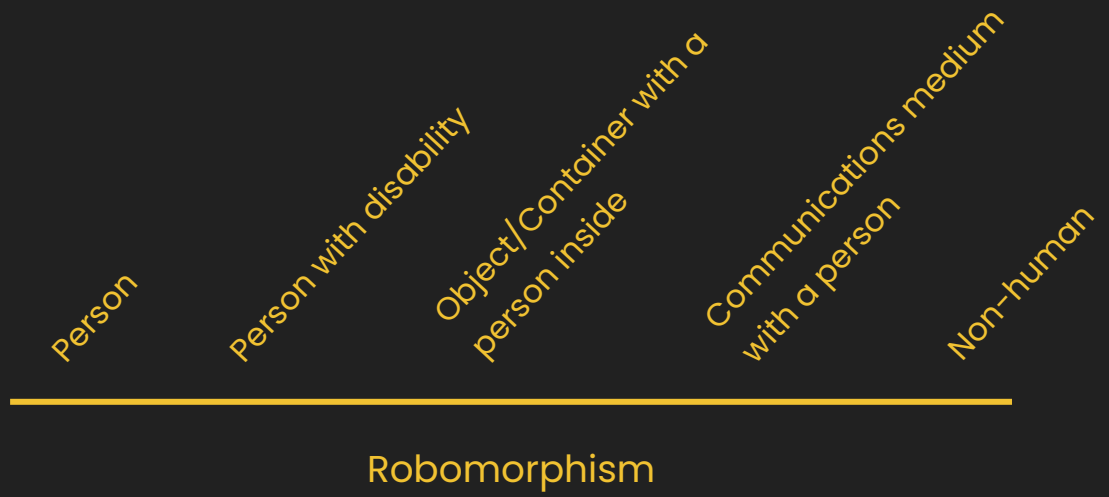
Analysing metaphors and language used when describing a robot-mediated person

- Person
- Person with disability
- Object/Container with a person inside
- Communications medium with a person
- Non-human

The perception is dynamic

Degrees of perceived humanity

Using Takayama & Go's metaphors to describe degrees of Robomorphism



Our work with Robotics

TableBot

A “simple” robot solution for collaborative work

Agency

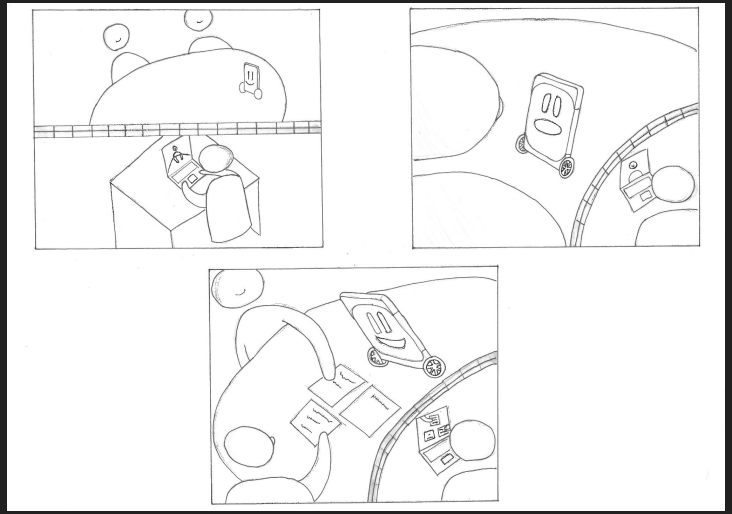
Freely move within a defined space

Indicate how they place their attention through robotic body language.

Availability

Affordable in a work context similar to our university experience (Autoethnography and Autobiographical approach)

Small and portable



Lucero (2018)
Neustaedter (2012)

TableBot

Focus: Proof of concept

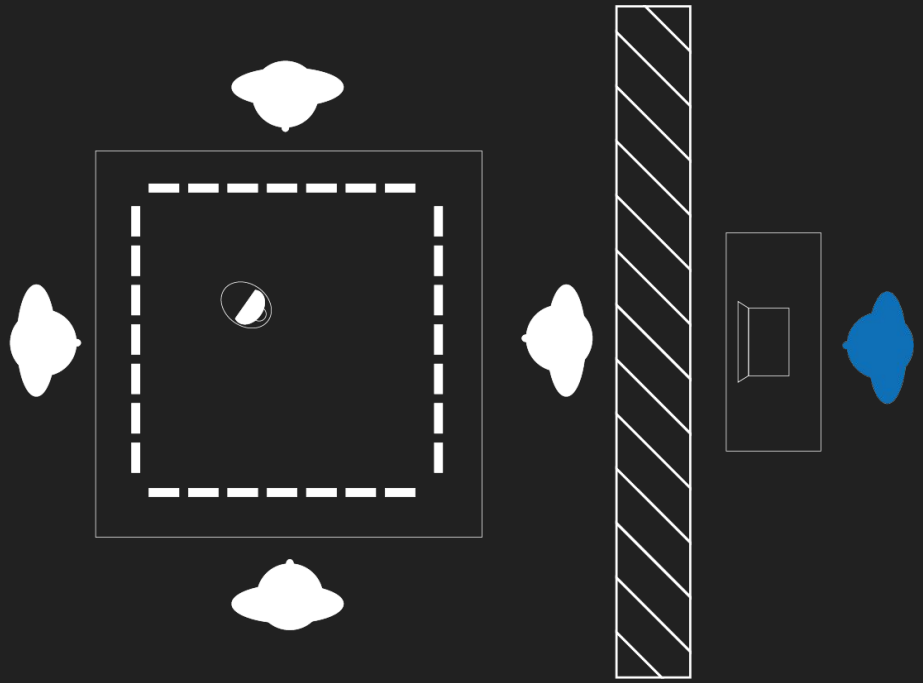
Focus: Collaboration

Study
Does this make sense?

Study
- Collaborative setting
- Control of remotes view
- Perception of the remote participant

Study
Does the abilities of the remote participant affect the perception of them?

Studying collaboration



Findings on Collaboration

Collaboration is essential!

- Not just in how solve the task, but also in how to include the remote person

Inclusion of the remote is best when both the remote and co-located participants communicate frequently on the remote's needs

- The remote must define clear needs and boundaries
- The co-located must offer support

The remote did not find it intrusive to be lifted or moved

- The remote expressed comfort and feeling respected from the interaction
- The co-located found it intrusive to touch the robot

The remote being able to indicate area of focus is essential for co-located participants understanding of the remote

- Not knowing clearly could create uncomfortable situations

Findings on Collaboration

The better tools for the remote,

the easier they are to be misunderstood and be provided less support.

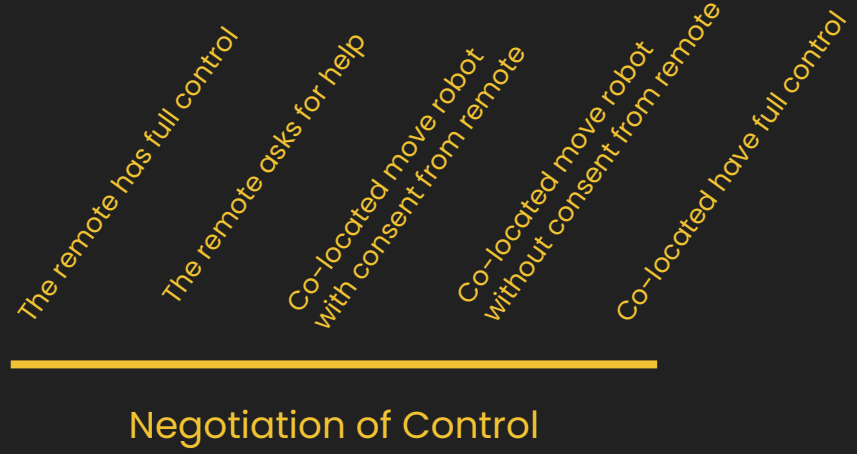
Collaboration as Negotiation of Control

To collaborate, control must be negotiated:

- Who has control
- How much control

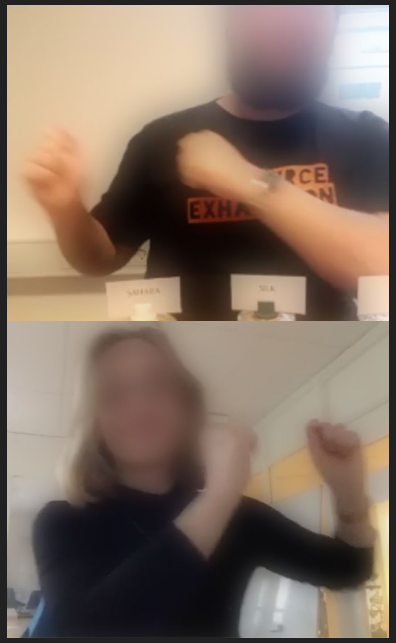
We identified a dynamic spectrum of five points

a) The remote has full control
b) The remote asks for help
c) The co-located move the robot with consent from the remote
d) The co-located move the robot without consent from the remote
e) The co-located remove all control from the remote



Collaboration as Negotiation of Control

Case 1: Dance episode



The remote has full control

The remote asks for help

Co-located move robot with consent from remote

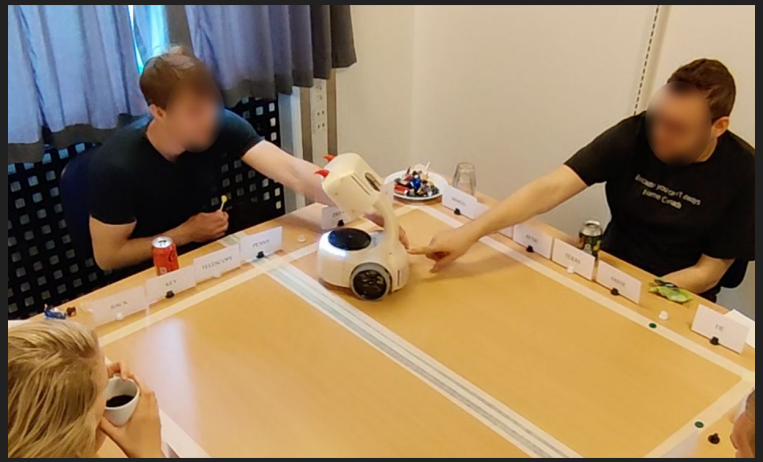
Co-located move robot without consent from remote

Co-located have full control

Negotiation of Control

Collaboration as Negotiation of Control

Case 2: Glitching episode



The remote has full control

The remote asks for help

Co-located move robot with consent from remote

Co-located move robot without consent from remote

Co-located have full control

Negotiation of Control

Collaboration as Negotiation of Control

Case 3: Hostage episode

The remote has full control

The remote asks for help

Co-located move robot with consent from remote

Co-located move robot without consent from remote

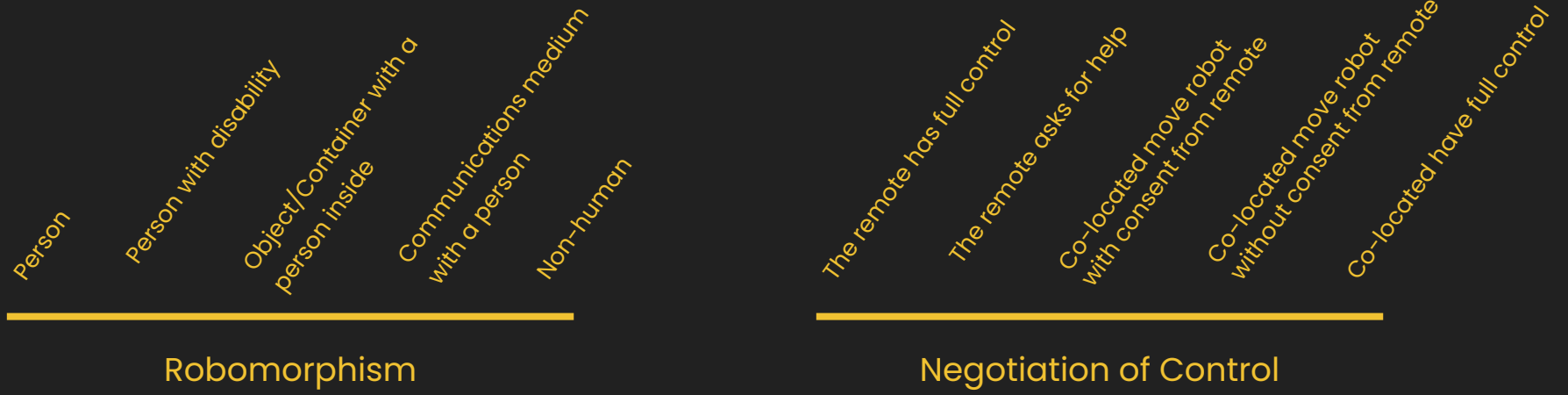
Co-located have full control

Negotiation of Control

Designing a framework

Let's now examine the existing body of work from the perspective of negotiation of control.

Is there a connection between the degree of control and the degree of human perception?



Designing a framework

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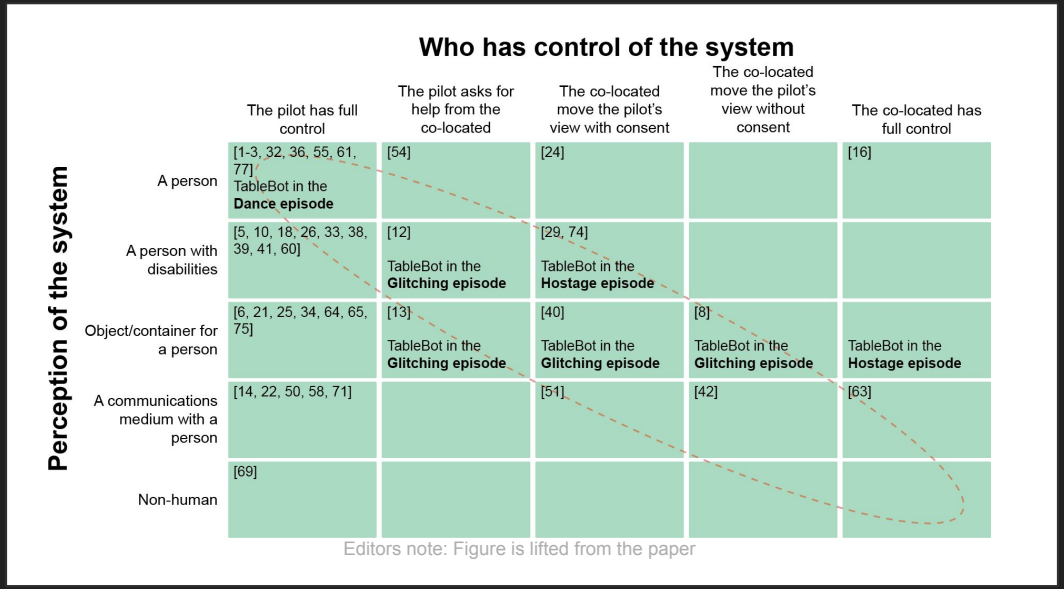

Editors note: Figure is lifted from the paper

Solving hybrid collaboration

Have we solved hybrid meetings? - No!

Have we made it more complicated? - Maybe!

Have hybrid meetings come to stay? - Yes!

But we have contributed some insights so it might get better some day.

Solving hybrid collaboration

It cannot be solved, because there is no ‘solution’

Each attempt at solving, only raises more concerns and questions — A wicked problem!

References Page 1 of 3

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